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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/381,061	12/06/1999	MASAYUKI TODA	FUK-59	3463

22855 7590 03/13/2003

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EXAMINER

BUEKER, RICHARD R

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 03/13/2003

19

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/381,061

Applicant(s)

TODA ET AL.

Examiner

Richard Bueker

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-9 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 13 May 0202 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 1763

Claims 1, 3-6 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, last two lines, the phrase "the inclination" lacks proper antecedent basis because claim 1 previously defines plural pores having plural inclinations, rather than a single inclination.

In claim 3, the phrase "said plurality of fine floating pores configured for floating the substrate body crosses a rotation axis of the substrate body" is non-idiomatic, vague and indefinite because the fine floating pores themselves do not "cross" the rotation axis of the substrate body. Applicants appear to be trying to describe a pattern or arrangement of fine floating pores in which the fine floating pores are located on both sides of the axis of rotation of the substrate body, but this limitation should be written in conventional idiomatic English. In claim 3, lines 7-9, the phrase "said fine floating pore" lacks proper antecedent basis and should be changed to "of said fine floating pores"; the phrase "one said quadrant" lacks proper antecedent basis and should be changed to "one of said quadrants"; the phrase "having a same floating pore direction" is vague and indefinite and should be changed to "has the same fine floating pore direction as the other plurality of fine floating pores provided within said one of said quadrants"; In claim 3, line 10, "said one said quadrant" should be "said one of said quadrants".

In claim 4, line 3, "one of at positions" is vague and indefinite. In claim 4, lines 5-6 should be rewritten as "periphery, each fine centering pore being angularly displaced,

Art Unit: 1763

relative to a center of said floating unit, from each adjacent fine centering pore", and in claim 4, lines 10-11, "a center" should be "said center".

In claim 5, line 6, "said adjacent" should be changed to "wherein adjacent" and in line 7, "being" should be changed to "are", and in claim 5, line 8, "opposite tangential directions" should be changed to "substantially opposite directions, said substantially opposite directions being tangential to said circle".

In claim 6, lines 5-6, "each said fine auxiliary pore" lacks proper antecedent basis and should be changed to "each said auxiliary fine suppression pore". In claim 6, lines 9-10, "said fine suppression pore orientations" lacks proper antecedent basis and should be changed to "said auxiliary fine suppression pore orientations".

It is noted, however, that the use of the word "orientation" in claims 4 and 6 as a substitute for "direction" is non-idiomatic and incorrect English usage. "Orientation" is defined as "arrangement or alignment", and "alignment" is defined as "the proper positioning or state of adjustment of parts" or "forming a line".

Claim 1 should first recite that the each of the various fine pores has a gas emitting direction defined as the direction in which gas is emitted from each particular fine pore, and an angle, defined as the angle formed between the gas emitting direction and the surface of the floating unit. Claims 2-6 should then go on to further describe the arrangement of each type of group of fine pores by referring to their gas emitting direction(s) and/or angle(s).

Claim 1 should also recite that all pore types have a gas emitting direction that forms an acute angle with the surface of the floating unit, instead of the present

Art Unit: 1763

language of “inclined against the surface of the floating unit” and “a direction of the inclination”. This is because the use of the words “inclined” and “inclination” do not necessarily exclude a pore with a gas emitting direction that is at a 90° angle to the surface, as disclosed by Hiura for his floating pores. It is noted that an incline can be an acute angle, but is not required to be only an acute angle. “Incline” is defined as “to deviate from a line, direction or course”. “Inclination” is defined as “the angle determined by two lines or planes”. Thus, “inclination” is broader than “acute”, and could include a 90° angle in addition to an acute angle.

In claim 9, the nozzle is not positively recited or linked to the apparatus previously recited in claim 8. In claim 9, lines 2 and 3, the phrase “where an internal diameter of a nozzle for blowing gas for film formation onto a surface of the substrate body” should be changed to “further comprising a nozzle for blowing gas for film formation onto a surface of the substrate body, wherein said nozzle has an internal diameter, and said internal diameter”.

Claims 1-9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hiura (JP 59-215718). Hiura discloses a substrate body floating apparatus having floating pores, centering pores and rotating pores. It optionally also includes transfer gas pores. Hiura describes up to five groups of pores. Hiura's apparatus also includes a heat lamp (optical lamp) for heating the substrate body. The centering pores and rotating pores are positioned in a surface of the apparatus such that their gas ejection directions form acute angles with the

Art Unit: 1763

surface of the apparatus. The flotation pores of Hiura are placed at right angles to the surface, but this meets the presently recited limitation of pores having an inclination.

“Inclination” is broadly defined by the dictionary to mean “the angle made by a line with the x-axis measured counterclockwise from the positive direction of that axis.” Nothing in this definition excludes a 90° angle. Regarding the various groups of fine pores defined by functionality, it is noted that the claims still do not require these groups to be separate from each other wherein each group is in addition to all of the other recited groups. A group of fine pores can perform more than one function. For example, the rotation pores and centering pores of Hiura also can have a flotation function. It is noted in particular that applicants’ specification (see the last sentence of page 6, for example) indicates that vibration is suppressed by rotation of the substrate, and therefore “a plurality of fine rotational pores configured for rotating the substrate body” as recited in claim 1 can also be considered to inherently be “a plurality of auxiliary fine suppression pores configured for suppressing vibration of the substrate body when the substrate body is rotated at high speed” as also recited in claim 1. It is noted also that the rotation pores of Hiura can also be arbitrarily divided into two groups, with one group referred to as rotation pores, and the other referred to as vibration suppression pores. Regarding claim 3, Fig. 3 of Hiura illustrates fine pores in which pores in a specific quadrant are aligned such that their gas ejection direction is the same for plural pores in said quadrant. Regarding claim 4, Hiura discloses centering pores as described in claim 4. Regarding claim 5, Hiura’s Fig. 2 illustrates rotation pores 6 on a circle 6’ in which two adjacent pores have gas ejection directions in opposite directions. It is noted

Art Unit: 1763

that the dictionary definition of "adjacent" is "not far". The rotation holes 6 of Fig. 2 of Hiura are located "not far" from each other. The pore arrangement of claim 6 reads on the holes labeled 4 in Fig. 2 of Hiura, or alternatively on the holes labeled 10, 12-1 and 12-2 of Fig. 3 of Hiura. In claim 8, the reference to a coating apparatus in the preamble represents a recitation of intended use that does not add further structural limitation to the recited apparatus, and the nozzle referred to in claim 9 is not positively recited as an additional structural limitation.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiura taken in view of Kisa (4,738,748). Kisa also discloses a wafer flotation and rotation apparatus, in which two sets of rotation pores are provided (see Fig. 5). It would have been prima facie obvious to provide the wafer flotation and rotation unit of Hiura with two sets of rotation pores as illustrated in Fig. 5 of Kisa, because Kisa teaches that this arrangement of rotation pores will successfully provide the desired wafer rotation. The use of additional rotation pores is merely additive and would have been prima facie obvious to one skilled in the art. It is noted again that applicants' specification indicates that wafer rotation reduces vibration, and thus an extra set of rotation pores, as illustrated by Kisa, would inherently function as vibration suppression pores.

Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiura in view of Kisa for the reasons stated above, and taken in further view of Bok (4,622,918), Granneman (WO 98/01890), Aschner (6,005,226) or Maruyama (6,001,175). Bok (abstract), Granneman (abstract), Aschner (col. 3, lines 48-57) and Maruyama (col. 19, line 1 to col. 20, line 36) each teaches that a substrate can be

Art Unit: 1763

coated by CVD while supported by gas in a substrate flotation unit. It would have been obvious to modify the apparatus of Huira by providing it with means to supply coating gas in view of Bok, Granneman, Aschner or Maruyama, who all teach that it is desirable to coat a substrate while it is floating.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Granneman in view of Hiura, Kisa and Foster. It would have been obvious to provide the flotation pores of Granneman's wafer processing apparatus in the pore arrangement disclosed by Hiura and Kisa because Hiura and Kisa teach that such a pattern of holes can successfully be used to process a semiconductor wafer. Foster is cited for his teaching that it is desirable to rotate a wafer during CVD.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Granneman in view of Hiura, Kisa and Foster, and in further view of Nishitani and White, who teach the use of a gas distribution nozzle of a diameter equal to the diameter of a wafer to be coated in a CVD apparatus. It would have been obvious to use such a nozzle in the apparatus of Granneman because Nishitani and White teach that such a nozzle can successfully be used to supply coating gas to a wafer in a CVD apparatus.

Claims 7-9 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Aschner or Maruyama, who both disclose an apparatus for floating, rotating and CVD coating a wafer. The gas ejection pores of Aschner and Maruyama inherently perform the functions of both floating and rotating the wafer. Regarding the function of suppressing vibration, it is noted that

Art Unit: 1763

vibration is inherently suppressed by rotation, and therefore the gas ejection pores of Aschner and Maruyama also inherently perform the function of suppressing vibration.

It is noted also that claims 7-9 do not require the presence of centering pores.

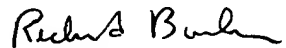
Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Aschner or Maruyama, in further view of Kisa. Kisa also discloses a wafer flotation and rotation apparatus, in which two sets of rotation pores are provided (see Fig. 5). It would have been prima facie obvious to provide the wafer flotation and rotation unit of Aschner or Maruyama with two sets of rotation pores as illustrated in Fig. 5 of Kisa, because Kisa teaches that this arrangement of rotation pores will successfully provide the desired wafer rotation. The use of additional rotation pores is merely additive and would have been prima facie obvious to one skilled in the art. It is noted again that applicants' specification indicates that wafer rotation reduces vibration, and thus an extra set of rotation pores, as illustrated by Kisa, would inherently function as vibration suppression pores.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (703) 308-1895. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Art Unit: 1763

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Richard Bueker
Primary Examiner
Art Unit 1763

February 28, 2003